MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2017 / 2018

TAS 3491 – ADVANCED SOFTWARE ENGINEERING

(All sections / Groups)

7 MARCH 2018
9:00 A.M. – 11:00 A.M.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages (including cover page) with 7 Questions only.
2. Attempt **ANY SIX** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1 (10 marks)

a) Describe ANY TWO of the basic characteristics of the Unified process.

[2 marks]

b) Draw the diagram that illustrates the Unified Process.

[5 marks]

c) What are workflows in the Unified Process? Give TWO examples of the primary workflows in the Unified Process.

[3 marks]

Question 2 (10 marks)

a) Describe ANY THREE techniques in detecting errors in formal specifications.

[3 marks]

b) Write suitable English sentences to show the meaning of the following predicate logic:

$$\forall x \, \forall y \, \text{Parent}(x,y) \rightarrow \text{Child}(y,x)$$

[2 marks]

c) Write a Z schema for a **Container** with two values: *contents* and *capacity*. Note that the value of contents must not be more than the value of capacity.

[5 marks]

Continued ...

Question 3 (10 marks)

a) Describe the following component-based models:
- Microsoft Component Object Model (COM)
- Enterprise Java Beans

[4 marks]

b) A Store component provides the interface 'OrderEntry' and requires the interface 'Account'. This component contains the following components:

Component	Provided interfaces	Required interfaces
Order	OrderEntry	Person OrderableItem
Customer	Person	
Product	OrderableItem	

Draw the component diagram to illustrate these components and their relationships. Note that the Store component delegates its interfaces to the corresponding internal component.

[6 marks]

Question 4 (10 marks)

a) Describe the TWO processing elements of the *Functional Model* of Web applications.

[3 marks]

b) Explain the following architectures of a Web application:
- Content architecture
- WebApp architecture

[4 marks]

c) Describe the testing process for Web applications, stating the major tests to be conducted in the process.

[3 marks]

Continued...

Question 5 (10 marks)

FCI is developing a Web-based system to manage the submission of assignments by students where the students will be able to submit their assignments directly to the faculty office instead of finding the lecturers.

- The lecturers can create, upload, and amend assignments details which can be viewed by the students, and the assignment lists can be viewed by the faculty staff.
- To submit assignments, students are required to hand in their assignments to the faculty staff at the faculty office. The staff then records the assignment submission in the system.
- Students can view their assignment submission date and status in the system, to verify and monitor the status of the assignments.
- Lecturers can view the assignment submission list. They can then collect the assignments from the faculty office and the faculty staff will record the assignment collection.
- Lecturers can then assess the assignments and update the results in the system.

a) Describe, in detail, how this system can be implemented using a 3-tier architecture.

[6 marks]

b) Briefly describe the following technologies:

- CORBA
- J2EE Architecture

[4 marks]

Continued...

Question 6 (10 marks)

(a) Give THREE reasons for using design patterns to develop software applications.

[3 marks]

(b) Give an example for each of the following type of design pattern. For each example, draw the class model representing the design pattern.

- Creational design pattern
- Structural design pattern
- Behavioral design pattern

[6 marks]

(c) Explain why the use of design pattern can improve the quality of a software application.

[1 mark]

Question 7 (10 marks)

XP Sdn Bhd is a software solutions company which adopts Extreme Programming in their software engineering activities. Programmers in this company work in pairs and to ensure quality in the software products, formal inspections are conducted as part of the software process.

a) Referring to the Agile Manifesto, describe the values that this company would be adhering to by adopting this methodology.

[4 marks]

b) Describe the main activities in the planning phase of this project.

[4 marks]

c) Explain ANY TWO benefits of pair programming.

[2 marks]

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